

# AIR FORCE RESEARCH LABORATORY



## Logistics Technology Assessment

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**THIS TECHNICAL REPORT HAS BEEN REVIEWED AND IS APPROVED FOR PUBLICATION.**

## **FOR THE COMMANDER**

//SIGNED//

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## Logistics Technology Assessment – Technical Memo

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### Summary

This report documents the research and development effort conducted under contract by the LOGTEC Corporation for the Logistics Readiness Branch. The original intent of the contract was for the government to host two logistics workshops to unfold the future research and development areas that most appealed to the logistics operators with the contractor in a supporting role. After a change in management direction soon after contract award, this effort was deemed unsupportable by the government and as a result was de-scoped to include only the work that had already been accomplished. The work accomplished to that date included contractor supported logistics survey development and data collection from subject matter experts at the Air Force Institute of Technology. These same surveys, which were modified by government personnel, were also taken to the annual Logistics Officers Association conference and were administered by government personnel. These survey responses captured the logistics needs from officers across Air Force specialties which in turn assisted the branch in shaping and planning future research endeavors.

### Background

The Air Force is in the process of transforming itself into a capabilities-focused Expeditionary Air and Space Force. According to CSAF Gen Jumper, "Our goal is to make warfighting effects, and the capabilities we need to achieve them, the drivers for everything we do." The Air Force is using a new approach called the CRRA, Capabilities Review and Risk Assessment, to analyze needs defined in capability terms, to measure risk, to prioritize capability objectives, and to identify technology gaps. The goal of the CRRA process and related initiatives has generated a need to translate investments in science and technology into an effects-based, capability-focused planning process. Based on this new thrust, the Air Force needs to have an integrated, corporate process to gather logistics-oriented needs, deficiencies, and science and technology investments into a coherent and efficient plan consistent with capability-based planning. This task was an effort to identify those requirements, currently described in multiple operational planning documents, and match them with the future science and technology programs aimed at meeting them. The stakeholders that are involved in an improved process for identifying and integrating logistics requirements include the Logistics Readiness Branch (AFRL/HEAL) and the Air Force Research Laboratory generally, the Air Staff (AF/A4), Air Force Logistics Management Agency, Air Force Material Command, and all Major Command logistics staffs.

### Methods

The work was to be accomplished in three phases. The first phase, to be accomplished by the government, was to develop a computer-based tool for documenting and managing Air Force logistics-oriented requirements, needs, and related studies, research, and technology developments. The second phase would address the scope and content of the

science and technology needed to satisfy unmet logistics needs. This work would have helped to refine S&T investment plans in light of this new Air Force strategy. Two Logistics S&T Workshops were to be conducted by the government with the contractor assistance, as well as the development and administration of a survey to validate the Top 12 logistics needs resulting from a workshop conducted by HEAL in June 2003. The survey was performed through a combination of web-based questionnaires and solicitation of expert opinions from meetings and conferences and other sources. The annual meeting of the Logistics Officers Association was determined to be a potentially rich source of logistics expert opinion that could be very economically captured for this purpose. After evaluating the results of the survey, the first workshop was to be conducted by assembling a panel of noted scientists and technologists to present model solutions in the form of research templates against the most important needs/requirements identified by the survey and as selected by the government.

The third phase was to unfold the scientific and technological challenges and opportunities that current logistics needs/requirements are presenting. A second workshop was planned to identify the gaps in current science and technology baselines related to the previously established Top 12 needs in order to unfold the specific research strategies that had the best chance of satisfying them. The previous workshop and survey results identified the top level "whats." The next workshop was to identify the low-level "hows." This would have required the expertise of both logistics customers and logistics scientists and engineers.

#### Survey of Logistics Needs/Deficiencies

Using the Top 12 needs and deficiencies identified by the 2003 workshop, the contractor assisted the government in developing a survey (see Appendix A) and data collection strategies to further refine the list of top logistics needs and deficiencies. In addition, the Air Mobility Master Plan and the Agile Combat Support Mission Area Plan was analyzed to augment the list of needs and deficiencies. Other relevant documents, such as the various CONOPS for capability-based planning, Depot Modernization, and Sense and Respond Logistics Capabilities supporting military transformation, were also analyzed to reveal significant unmet science and technology needs applicable to the AFRL research mission in general and the overall Air Force mission.

After evaluating the results of the survey and inputs from the workshops, the contractor was to develop solution sets for targeted needs/requirements in the form of research templates. The objective was to uncover and explicate the substance of research efforts that might be undertaken by the Logistics Readiness Branch to meet required capabilities in targeted needs/requirements. In developing these solution sets, the contractor was to consider the unique mission of the Logistics Readiness Branch in human-centered research and technology in logistics.

#### Results

The contractor assisted the government in collecting data at two locations. The first location was a class at AFIT; the second location was the Logistics Officer's Association Annual Meeting in Las Vegas, NV. The results are shown in Table 1.

The majority of the respondents were Captains (40%), followed by 1<sup>st</sup> Lieutenants (18.2%), and Majors (14.5%). The majority of respondents were military (89.1%) and 80% were on active duty. The years of experience in maintenance ranged from 0 to 30 with a *mean* of 7.44 (*sd*=8.255). The years of experience in Logistics ranged from 0 to 28 and with a *mean* of 5.56 (*sd*=6.577).

Respondents were able to rate the *importance* and *priority* of each need on a 5-point Likert Scale ranging from 1 being a Low Priority/Least Important to 5 being High Priority/Most Important. After analyzing the means for each need based on importance and priority, two needs were ranked the highest in priority and importance; **Logistics Infosphere** and **Maintenance Performance**. Although no need was ranked below the midpoint on either scale, the need, Support for Logistics Wargaming/Simulation was ranked the lowest on both scales. Please refer to the table below for the means and standard deviations of all needs on both scales.

**Table 1: Descriptive Statistics**

NEED	<i>N</i>	<i>Mean</i>	<i>SD</i>
*Importance of Logistics Infosphere	172	4.24	0.769
*Priority of Logistics Infosphere	171	4.05	0.900
Importance of Logistics Planning	167	4.02	0.944
Priority of Logistics Planning	166	3.75	1.018
*Importance of Maintenance Performance	167	4.19	0.942
*Priority of Maintenance Performance	167	4.02	0.991
Importance of Support for Logistics Wargaming/Simulation	168	3.54	1.032
Priority of Support for Logistics Wargaming/Simulation	170	3.22	1.124
Importance of Workforce Issues	171	4.11	0.930
Priority of Workforce Issues	172	3.92	1.051
Importance of Maintenance Management Information Systems	164	4.01	0.829
Priority of Maintenance Management Information Systems	165	3.84	0.937
Importance of Joint/Coalition Logistics	169	3.99	0.935
Priority of Joint/Coalition Logistics	173	3.71	1.156
Importance of Logistics Support Factors in Design/Acquisition	169	3.82	0.917
Priority of Logistics Support Factors in Design/Acquisition	169	3.53	0.988

*Note.* Star indicates needs with highest priority and most important.

### Conclusions

The results of the survey indicate the need for additional investigation and research in the areas of Logistics Infosphere and Maintenance Performance. Both of these areas of research are being pursued through the Focused Long Term Challenge (FLTC) planning effort.



## APPENDIX A

The purpose of this survey is to get your opinion concerning Logistics and Maintenance needs in order to focus our research & development efforts on improving existing Mx and Logistics work environments. Please circle the number that you think best represents the importance and priority of the following Air Force Logistics needs:

**Optional** - List three other logistics needs amenable to science and technology solutions that you think deserve to be highlighted. Again, the perspective is warfighting utility. Then, rank the logistics issues in order of importance (1=most important and 3=least important):

Issue	
Issue	
Issue	

Any further comments or suggestions?

AFRL/HEAL Survey of Logistics & Mx Technology Needs for Research Purposes		PRIORITY	
IMPORTANCE		Low	High
Least	Most		
1	2 3 4 5	1	2 3 4 5
Logistics importance			
(integrating multiple sources of information into a common logistics operating picture. Includes total asset visibility)			
1	2 3 4 5	1	2 3 4 5
Logistics planning			
(tying log plans to operational plans for adaptive, precise logistics support)			
1	2 3 4 5	1	2 3 4 5
Maintenance performance			
(improving mean time to repair through better troubleshooting support, tech data, battle damage repair, logistics maintainability, improved BIT/FIT diagnostics, etc.)			
1	2 3 4 5	1	2 3 4 5
Support for logistics			
(wargaming/simulation incorporating logistics factors more realistically in wargames, exercises, and modeling developments)			
1	2 3 4 5	1	2 3 4 5
Workforce issues			
(better training, retention, utilization, job aiding, job structures, etc.)			
1	2 3 4 5	1	2 3 4 5
Maintenance management information			
(includes more accurate data collection and analysis, failure prediction/prognostics, etc.)			
1	2 3 4 5	1	2 3 4 5
Joint/Coalition logistics			
(procedures and technologies allowing better coordination with services and coalition partners)			
1	2 3 4 5	1	2 3 4 5
Logistics support factors in design/acquisition			
(includes design for supportability incorporating weapons design systems, and digital production of tech data, training media, etc.)			
1	2 3 4 5	1	2 3 4 5



Duty Title \_\_\_\_\_ Rank \_\_\_\_\_ MAJ/COM \_\_\_\_\_  
 AFSC \_\_\_\_\_  
 Years of experience in: Mx \_\_\_\_\_ Logistics \_\_\_\_\_  
 Choose one: Military \_\_\_\_\_ Retired \_\_\_\_\_ Civilian \_\_\_\_\_  
 Choose one: Active \_\_\_\_\_ GUARD \_\_\_\_\_ RES \_\_\_\_\_

Your decision to complete this survey is absolutely voluntary. No one has coerced or intimidated you into completing this survey. AFRL/HEAL representatives have adequately answered any and all questions you have about this survey and the procedures involved. You may withdraw from completing this survey at any time and discontinue further participation in this study without prejudice to your entitlements. If you have any questions or comments, please contact Capt. Randall at (DSN) 986-4145 or (COMM) 937-656-4145.